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(56) Documents Cited

GB 2260844 A GB 2257554 A GB 2183886 A

GB 2149544 A GB 2085663 A DE 042043266 A

(58) Field of Search

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INT CL⁶ G06F 1/16 1/18 1/26 , H02J 7/32 , H04Q 7/32

ONLINE: WPI; COMPUTER

(54) DATA DISPLAY DEVICE

(57) A reading device utilizing a ROM data carrier has a tablet-like body (5) carrying a display screen (12) for displaying data from the carrier. Electrical power generating means for powering data processing means to produce the display on the screen can be driven from an external energy source. Preferably, the device has a panel (14) hinged to the body to be movable to and from a position covering and protecting the display screen.

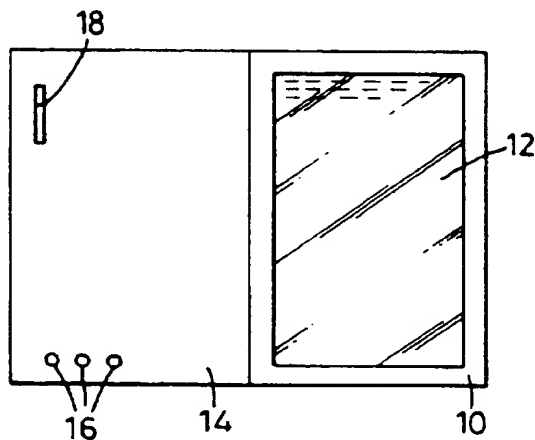


Fig. 1

At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1995

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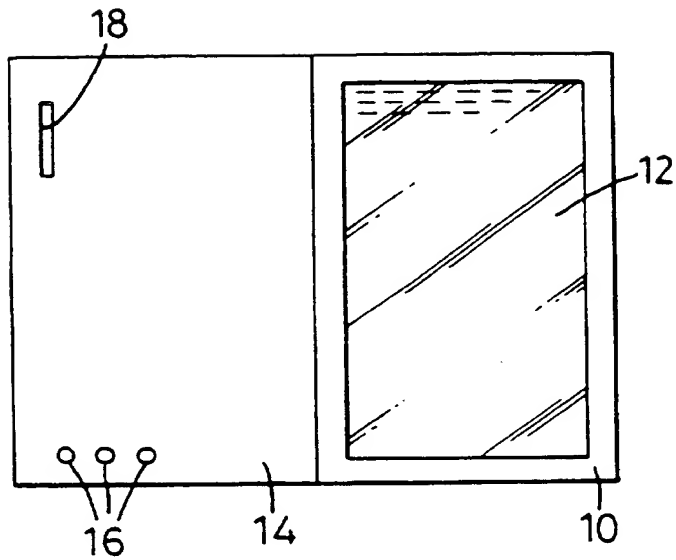


Fig. 1

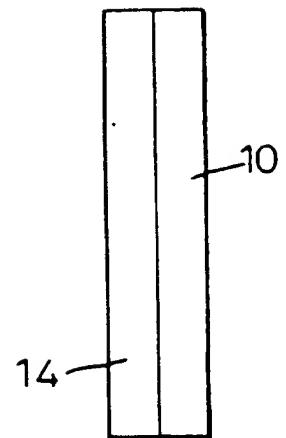


Fig. 2

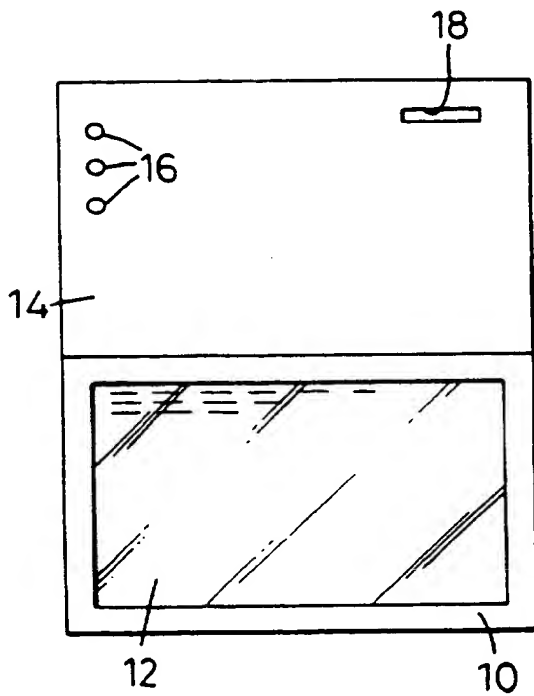


Fig. 3

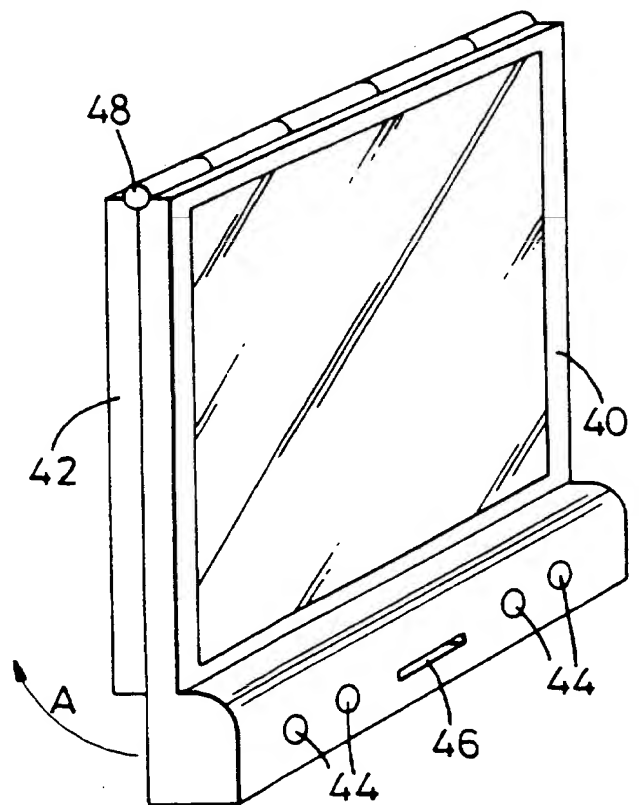


Fig. 4

DATA DISPLAY DEVICES

This invention relates to a data display device comprising a display screen, more particularly for the display of texts or other matter conventionally contained in printed publications, but not necessarily exclusively so.

The use of printed publications, in particular books, has a number of disadvantages, not least being their bulk. This can make it difficult to carry a large number of publications, quite apart from the problem of their storage. If the bulk of a book is reduced by making the print smaller, it may be difficult for many people to read it. Furthermore, as the conventional medium for printed publications, paper is a fragile material and is prone to accidental damage.

It is known to store data in a laser disc to be read electronically but the devices provided for this purpose are relatively bulky and rely on access to electrical means power, or if portable require a storage battery, which adds significantly to the weight of the device.

It is an object of the present invention to provide a device for the display of material such as is commonly contained in printed publications in a way which avoids these disadvantages, and also so as to avoid the inconvenience of being totally reliant on mains or storage battery power.

According to the present invention there is provided a reading device provided with data processing means and a location for a ROM data carrier, the device further comprising a tablet-like body carrying a display
5 screen for the display of data from said carrier by the data processing means, and electrical power generating means for transforming an input from an external energy source to power the data processing means.

The power generating means may comprise means
10 that are arranged to be operated by the user, such as a clockwork motor, or means to generate electrical power from another external energy source, such as solar power cells. It is possible to provide additionally a battery power source for powering stand-by functions when the
15 device is not in use.

Preferably the device comprises a panel hinged to the body to be movable to and from a position covering and protecting said display screen. It can be arranged that pivoting the panel to expose the screen, and
20 possibly the reverse movement too, provides an energy input that is transformed in the device into electrical power. If solar cells are provided they can be mounted on a face of a panel to be exposed to ambient light when the screen is uncovered.

25 The accompanying drawing illustrates examples of the invention. In the drawings:

Figs. 1 and 2 illustrate a first device according to the invention open and closed respectively,

Fig. 3 illustrates how the display on the screen of the device changes with the orientation of the device, and

Fig. 4 illustrates another device according to
5 the invention.

The reading device of Figs. 1 to 3 comprises a tablet-like body 10 with a flat face occupied by a display screen 12, in particular a back-lit liquid crystal display. A cover panel 14 is hinged to the body.
10 The drawings show control buttons 16 on the panel for operating the device and a slot 18 for the insertion of a ROM chip. In the interior of the device are data processing means (not shown) and means for supply electrical power to the data processing means and the
15 screen. The data processing means may be entirely conventional and serve for the display of selected data from the ROM on the screen. The slot 18 incorporates a plug socket connection for the simple insertion and removal of the ROM microchip which will itself be
20 suitably encapsulated to protect against damage when removed from the device.

The power supply means are also not illustrated but may comprise a miniature electrical generator device to a clockwork or air pressure mechanism which is powered
25 by the hinged movement of the panel 14.

The data in the replaceable ROM can contain the contents of a book and the controls of the device are arranged to bring the data selectively onto the screen.

The user, in swinging open the panel 14, brings up a "page" of the data onto the screen and generates sufficient power to operate the device for a few minutes, since the power demand may be kept very low. The device is then used in the manner of a book. When the displayed "page" has been read, the user swings the panel closed and open again, which generates more power to maintain the display for a few further minutes and also advances the display to the next page. The controls allow the user to turn back to a previous page and they may also include means to magnify the image on the screen so that it can be read equally easily by the visually impaired.

Means can be provided for interactive use of the ROM data. For example, search functions can be provided analogous to an index of the data.

A generally rectangular display screen will usually be preferred and the data processing means may be arranged to display lines of words in the direction of either pair of parallel sides of the screen, as shown in Figs. 1 and 3 respectively. These alternatives may be chosen at the command of the reader and/or a gravity switch may be adapted to give the appropriate display for the position in which the device is held.

In the second embodiment shown in Fig. 4, the device similarly has a tablet-form body 40 carrying a screen and a panel 42 hinged to the body. In this instance, the panel carries an array of solar cells (not shown) on that face that is directed away from the body

in the drawing. The cells generate the operating power for the device. The panel is pivotable as indicated by the arrow A through 360° when not in use to a closed position in which the display screen and solar cells are brought face to face to be protected within the outer walls of the body 40 and panel 42. Fig. 4 also illustrates control buttons 44 and a ROM insertion slot 48, analogously to the first example.

In use, the solar cells generate the power to operate the internal data processing unit and the LCD screen. The user can adjust the angular position of the panel to optimise the power generated by the cells, the hinge 48 preferably incorporating a ratchet or friction means (not shown) to retain it at any chosen angular adjustment.

It is possible to power a device according to the invention in other ways which are not dependent on access to electrical mains power or having a charged electrical storage battery. An auxiliary battery is nevertheless preferably included in the device. This can operate a number of functions when the device is inoperative. For example, it can allow the data processing means to store the page position when a reader closes the device down, so that the display returns to the appropriate place when next operated.

It is also possible to provide means for operation of the device by electrical storage batteries or by an electrical mains supply as an alternative power

source.

It will be understood that devices according to the invention can be completely portable and the equivalent of a large number of books can be carried with
5 no perceptible increase of bulk, whether on the same microchip on separate microchips. It is also possible to use other forms of data carrier, if preferred, including optical discs.

The devices according to the invention may be
10 essentially sealed units, the only external access required being that for insertion of the ROM, which can be suitably protected. It is therefore possible to provide a device in a form that is usable in conditions inappropriate for printed matter, even underwater.

15

CLAIMS

1. A reading device provided with data processing means and a location for a ROM data carrier, the device further comprising a tablet-like body carrying a display screen for the display of data from said carrier by the data processing means, and electrical power generating means for transforming an input from an external energy source to power the data processing means.
2. A device according to claim 1 comprising a panel hinged to the body for movement to and from a position covering and protecting said display screen.
3. A device according to claim 1 or claim 2 wherein the power generating means comprise means arranged to be operated by the user.
4. A device according to claim 3 wherein the power generating means comprises a clockwork mechanism.
5. A device according to claim 2 together with claim 3 or claim 4 wherein the movement of said panel is arranged to provide an energy input for said power generating means.
6. A device according to any one of claims 3 to 5 wherein said operation of the power generating means by the user is also arranged to trigger a change of the data

displayed.

7. A device according to any one of the preceding claims wherein the power generating means comprise means
5 utilizing an external energy source.

8. A device according to claim 2 together with claim 7 wherein the power generating means comprise solar cells mounted on a face of the panel to be exposed to
10 ambient light when the screen is uncovered.

9. A device according to claim 8 wherein said panel is angularly adjustable on the body when the screen is uncovered.

15

10. A device according to any one of the preceding claims comprising an electrical storage battery power source.

20 11. A device according to any one of the preceding claims and arranged to display data in the form of text, the device incorporating gravity-sensitive means for changing the orientation of the text displayed on the screen.

25

12. A data display device constructed and arranged for use and operation substantially as described herein with reference to the accompanying drawings.

Application No: GB 9506862.3
 Claims searched: ALL

Examiner: R F King
 Date of search: 5 July 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:
 UK CI (Ed.O): G5C[CHA]; H2A[AKX1,AKXX]; H2H[HBCH]; H4T[TADD, TAXA, TBAX]
 Int CI (Ed.6): G06F 1/16, 1/18, 1/26, 1/32; H02J 7/32; H04Q 7/32E
 Other: ONLINE: WPI, COMPUTER

Documents considered to be relevant:

| Category | Identity of document and relevant passage | Relevant to claims |
|----------|--|--------------------|
| X | GB2257554 A [D'oyly] See whole disclosure (claim 5, see lines 31/32 page5) | 1,2,3,5,7, 8,10 |
| X | GB2149544 A [S.T & C] See abstract. | 1,3,10 |
| X | GB2085663 A [Lin] See whole doc. | 3,4,5 |
| X | DE4204326 A [Reichert] See abstract. | 1,2,3,7,8 |
| A | GB2260844 A [Sony] See abstract | 1 |
| A | GB2183886 A [Bottriell] See abstract. | 1 |

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| X | Document indicating lack of novelty or inventive step | A | Document indicating technological background and/or state of the art. |
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